Patent claims

1. A spraying device for melt granulation in fluidised bed comprising a nozzle (2) with a feed channel (4) for a liquid to be atomised, where the liquid is led through emulsifying means (6) and into an internal mixing chamber (5) for gas and liquid, before it is fed to the fluidised bed,
characterized in that the nozzle (2) has a separate channel (7) for the atomising gas fitted concentrically around the central liquid supply channel (4) for the liquid to be atomised or nebulised, and where the mixing chamber (5) surrounds the outlet zone of the liquid spray from the emulsifying means and the gas, allowing efficient mixing of high speed atomisation gas and liquid, and having an external gas cap (1) where fluidisation gas is channelled into a spout above the spraying device.

2. A spraying device according to claim 1,
characterized in that the mixing chamber (5) is cylindrical with an upper conical part.

3. A spraying device according to claim 2,
characterized in that the ratio L/D of the mixing chamber (5) is in the range 0.5 to 5 and the l/d ratios in the range 0.1 to 2.

4. A spraying device according to claim 2,
characterized in that the ratio
L/D of the mixing chamber (5) is in the range 1 to 4 and the l/d ratios in the range 0.25 to 1.

5. A spraying device according to claim 1,
characterized in that the mixing chamber (5) is conical.

6. A spraying device according to claim 1,
characterized in that the gas cap (1) is conical and fitted to a perforated bottom plate (3), concentrically around the nozzle (2).

7. A spraying device according to claim 6,
characterized in that the gas cap (1) has a height of 10 to 200 mm above the bottom plate (3), preferably 20 to 100 mm.

8. A spraying device according to claim 6,
characterized in that the gas cap (1) has an upper aperture diameter of 20 to 150 mm and a bottom aperture diameter of 30 to 300 mm, preferably 35 to 100 mm and 40 to 200 mm, respectively.

9. A method for preparation of solid granules in a fluidised bed, where a liquid material is atomised by supply of an atomising gas and sprayed into the fluidised bed through spray nozzles (2) mounted vertically and where the fluidised bed is maintained by fluidisation gas blown upwards through a perforated plate underneath the bed,
characterized in that a portion of the fluidisation gas is channelled through a gas cap (1) surrounding the nozzle for creation of a gas spout above the spraying device.

10. A method for preparation of solid granules from a liquid material in a fluidised bed by using a nozzle (2) with a feed channel (4) for a liquid to be atomised, where the liquid is led through emulsifying means and into an internal mixing chamber (5) for gas and liquid, before spraying the atomised liquid upwardly into the fluid bed layer,
characterized in that the atomising gas is led to the mixing chamber (5) in a channel (7) concentrically to the liquid and into the mixing chamber surrounding the outlet openings for both liquid and gas, allowing efficient mixing of high speed atomisation gas and liquid, and where a portion of the fluidisation gas is channelled through a gas cap (1) surrounding the nozzle (2), thus creating a gas spout above the spraying device.

11. Use of a spraying device according to claims 1-8, in a process for preparation of granules of urea, and other melts suitable for producing fertiliser products, such as calcium ammonium nitrate, ammonium nitrate, ammonium sulphate and mixtures thereof.